REMARKS

Claims 1-44 constitute all currently pending claims. Claims 1-44 are amended.

Specification

The Examiner has objected to certain informalities of language, and a lack of titles in the

present Specification. Attached herewith is a substitute specification, correcting the

Specification as suggested by the Examiner. Accordingly, Applicant respectfully requests that

the objections to the specification be withdrawn.

Applicant also hereby amends the Abstract in order to remove the language objected to

by the Examiner. Accordingly, Applicant respectfully requests that the objection to the Abstract

be withdrawn.

Claim Objections

The Examiner objects to claims 9 and 35 because these claims are separated from their

parent claims by claims which do not depend from the same parent claims. Applicant

respectfully notes the following portion of the MPEP:

> During prosecution, the order of claims may change and be
> in conflict with the requirement that dependent claims refer to a
> preceding claim. Accordingly, the numbering of dependent claims
> and the numbers of preceding claims referred to in dependent
> claims should be carefully checked when claims are renumbered
> upon allowance.

MPEP § 608.01(n)[IV].

Applicant, therefore, respectfully submits that the reordering of claims 9 and 35, and their

dependent claims, is not strictly required and would unnecessarily complicate the prosecution of

these claims and their related dependent claims. Furthermore, the MPEP, as quoted above,

clearly foresees that such cases will arise during prosecution, to be corrected straightforwardly

when claims are renumbered upon allowance. Accordingly, Applicant respectfully requests that

the Examiner withdraw this objection.

The Examiner also objects to claims 1-20, 24-42 are because of alleged informalities.

The claims have been extensively amended in order to address the Examiner's objections. The

following claims, however, have not been amended in the manner suggested by the Examiner,

for the reasons explained below.

In claim 2, since a MAC address is a property of each terminal, rather than being

assigned by the claimed server, it is more appropriate to recite "a MAC address of" than "a MAC

address for," as suggested by the Examiner. In claim 11, the antecedent basis of the term "said

table" has been clarified due to a change in dependencies, as claim 11 now depends indirectly

from claim 4, which recites "a table." Accordingly, Applicant respectfully requests that the

Examiner withdraw this objection.

Claim Rejections Under 35 U.S.C. § 101

Claims 1-20 and 28-42 stand rejected under 35 U.S.C. § 101 as allegedly being directed

to non-statutory subject matter. Applicant traverses this rejection for at least the following

reasons. Applicant traverses this rejection for at least the following reasons.

Applicant refers the Examiner to the USPTO Guidelines revised subsequent to the

decision in Ex parte Lundgren, Appeal No. 2003-2088 (Bd. Pat. App. & Int. 2005), available at

http://www.uspto.gov/web/offices/dcom/bpai/prec/2003-2088.pdf. Interim Guidelines for

Examination of Patent Applications for Patent Subject Matter Eligibility, 1300 Off. Gaz. Pat.

Office 142 (Nov. 22, 2005), available at http://www.uspto.gov/web/offices/com/sol/og/

patgupa.htm.

A. Claims 1-3 and 10-20

Regarding claim 1, which is directed to a processing server for allocating to user

terminals resources of a local area network, the Examiner contends that the claim is not directed

to a statutory category of invention, and fails to recite any structure other than software.

First, the Examiner notes that the claim is directed to "a processing server," and is thus

directed to a "machine," which the Examiner notes is one of the statutory categories of invention

under 35 U.S.C. § 101. The present disclosure states that in an exemplary embodiment, "[a]

processing server 10 is provided, preferably in the edge router 2," and that "[t]his server could

instead be provided in one of the access points of the wireless local area network."

(Specification at 10, lines 1-6.) Furthermore, the present disclosure states that "[t]he processing

server 10 preferably includes a memory 13," (Specification at 13, lines 9-10.) Thus, it is clear

that the "processing server" to which claim 1 is directed, when read properly in light of the

specification, refers to a machine.

Amended claim 1 further recites "control means." The present disclosure describes

ample structure which may correspond to the claimed control means. For example, portions of

the present disclosure describe certain exemplary embodiments as follows.

The present disclosure states that "The processing server 10 includes a control module

11." (Specification at 10, line 37 to 11, line 1.) (emphasis added.) Thus, in this exemplary

embodiment, a control module 11 is included in the processing server 10. Furthermore, the

present disclosure states that "The control module 11 . . . of the processing server 10 . . . can take

the form of electronic circuits, software (or data processing) modules, or a combination of

circuits and software." (Specification at 17, lines 7-11.) (emphasis added.)

Moreover, claim 1 cannot be considered to be directed merely to an abstract

mathematical algorithm, because claim 1 also recites that the "control means [are] adapted to . . .

allocate resources of said local area network to terminals," thus creating a useful, concrete, and

tangible result related to network terminals and resources of a local area network. In short, the

claim as a whole is clearly directed to a processing server which manages a network and

terminals, not to a disembodied or abstract mathematical concept.

Further, the presentation of various limitations in means-plus-function format does not

alter this result, as clarified by In re Alappat, 33 F.3d 1526 (Fed. Cir. 1994) (*en banc*). The claim

at issue in <u>Alappat</u> was presented entirely as a series of means-plus-function limitations. According to the *en banc* majority, such a claim is to be interpreted in accordance with 35 U.S.C. § 112, sixth paragraph, and not simply reinterpreted as a claim failing to recite structure. Id.

Thus, claim 1 recites statutory matter under 35 U.S.C. § 101. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of amended independent claim 1 and its dependent claims 2-3 and 10-20.

B. Claim 28

Regarding claim 28, the Examiner contends that the claim lacks a useful, concrete and tangible result in the case that no terminal attempts to set up a connection with the local area network. Applicant respectfully submits that the Examiner is attempting to improperly narrow Applicant's claims by requiring additional unclaimed limitations. There is no requirement that Applicant must claim an act for every possible case of a condition. If the Examiner contends otherwise, Applicant respectfully requests that the Examiner provide evidence supporting any such alleged requirement. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claim 28 and its dependent claims 29-42.

C. Claims 43 and 44

Claims 43 and 44 stand rejected under 35 U.S.C. § 101 because the claimed recitation of a use, without setting forth any steps involved in the process, allegedly results in an improper definition of a process. Applicant hereby amends claims 43 and 44, and submits that these

claims are not now improper. Accordingly, Applicant respectfully requests that the Examiner

withdraw the rejection of claims 43 and 44.

Claim Rejections Under 35 U.S.C. § 112

Claims 43 and 44 stand rejected under 35 U.S.C. § 112 as allegedly being indefinite.

Applicant hereby amends claims 43 and 44, and submits that these claims are not now indefinite.

Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claims

43 and 44.

Claim Rejections is 35 U.S.C. § 103

A. Claims 1-16, 21-23, 25, and 27-42

Claims 1-16, 21-23, 25, and 27-42 stand rejected under 35 U.S.C. § 103(a) as allegedly

being unpatentable over U.S. Patent Application Publication No. 2002/0075844 A1 to Hagen

("Hagen") in view of U.S. Patent No. 6,408,336 S1 to Schneider et al. ("Schneider"). Applicant

traverses this rejection for at least the following reasons.

The Examiner contends that Hagen discloses all the limitations of claims 1-16, 21-23,

and 27-42, but properly notes that Hagen fails to disclose the terminals being classified

according to their ability to use encryption. The Examiner further argues that the encryption-

related requirements of all of claims 1-16, 21-23, and 27-42 are taught by Schneider, and that

one of ordinary skill in the art at the time of invention would have combined Hagen in view of

Schneider based on the alleged motivation "to make the system more scalable."

Applicant respectfully submits that the Examiner's proposed motivation to combine Hagen in view of Schneider fails to support a prima facie case of obviousness regarding the above claims. The alleged motivation "to make the system more scalable" is too vague and general to suggest the desirability of explicitly classifying terminals based on their ability to use encryption, or the desirability of allocating network resources based on such a classification.

Even if, *arguendo*, Hagen were to teach allocating network resources to terminals based on other criteria, in order to support a prima facie case of obviousness the Examiner must put forth a teaching or suggestion that would lead one of ordinary skill in the art at the time of invention to consider basing such classification or allocation on the ability of terminals to use encryption. The desire "to make the system more scalable," even combined with a "general concept of classifying network clients according to their security traits," would be insufficient to motivate one to combine Hagen in view of Schneider without the benefit of improper hindsight.

This is especially so in light of the fact that Schneider does not explicitly disclose performing any actions akin to classifying terminals or allocating resources, based on a terminal's ability to use encryption. The cited portions of Schneider merely appear to teach that "a trust level" for a request must be sufficient in comparison to a "sensitivity level" of a resource in order to give the request access to the resource. (Schneider at col. 10, lines 6-34.) In other words, although Schneider appears to teach considering to what extent a request should be trusted, and comparing that "trust level" with the sensitivity of a resource to be accessed,

nowhere is it suggested in either Hagen or Schneider that this "trust level" is a classification, that

it comprises groups, or that it could or should be used to <u>allocate</u> resources of a network.

Thus, the Examiner's purported motivation to combine Hagen in view of Schneider fails

to support a prima facie case of obviousness. Moreover, even in combination, these references

as a whole fail to teach or suggest the claimed limitations. Accordingly, Applicant respectfully

requests that the Examiner withdraw this rejection.

B. Claims 17-20 and 24

Claims 17-20 and 24 stand rejected under 35 U.S.C. § 103(a) as allegedly being

unpatentable over Hagen and Schneider, and further in view of Comer, "Internetworking with

TCP/IP Vol. 1." Applicant traverses this rejection for at least the following reasons.

Claims 17-20 and 24 ultimately depend from independent claim 1. As explained above,

the Examiner's proposed motivation to combine Hagen in view of Schneider is insufficient to

support a prima facie case of obviousness. Moreover, Comer fails to make up for the

deficiencies of these references, as Comer is cited only for its alleged teaching of a cabled

interface, i.e., Ethernet, and of a wireless LAN. Thus, the combined references, taken as a whole

for what they would have suggested to one of ordinary skill in the art at the time of invention,

fail to render claims 17-20 and 24 obvious. Accordingly, Applicant respectfully requests that the

Examiner withdraw this rejection.

C. Claims 43 and 44

Claims 43 and 44 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Hagen in view of Schneider. Applicant traverses this rejection for at least the following reasons.

Claims 43 and 44 ultimately depend from independent claim 28. As explained above, the Examiner's proposed motivation to combine Hagen in view of Schneider is insufficient to support a prima facie case of obviousness. The Examiner's statement, that PSTN, PLMN, IP, and PABX private networks and private communication gateways are well-known in the art, fails to remedy the above-described deficiencies. Thus, the combined references, taken as a whole for what they would have suggested to one of ordinary skill in the art at the time of invention, fail to render claims 17-20 and 24 obvious. Accordingly, Applicant respectfully requests that the Examiner withdraw this rejection.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Applicant herewith petitions the Director of the USPTO to extend the time for reply to the above-identified Office Action for an appropriate length of time if necessary. Unless a check is attached, any fee due under 37 U.S.C. § 1.17(a) is being paid via the USPTO Electronic Filing System (EFS). The USPTO is also directed and authorized to charge all required fees, except for

the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any

overpayments to said Deposit Account.

                                        Respectfully submitted,

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A METHOD AND A SERVER FOR ALLOCATING LOCAL AREA NETWORK
RESOURCES TO A TERMINAL ACCORDING TO THE TYPE OF TERMINAL

BACKGROUND OF THE INVENTION

5   1. Field of the Invention

The field of the invention is that of communication
between terminals within networks, and more particularly
that of allocating local area network resources to
terminals.

10   2. Description of Related Art

Many public and private sector organizations and
many companies and company groups use wired local area
networks (LAN) and wireless local area networks (WLAN).
These local area networks provide access to local

15 information to persons (users) who connect to a network
access point, e.g. a terminal equipped with a fixed or
removable LAN or WLAN card.

However, some local area networks also allow
approved users to access other communication networks,

20 for example Internet/IP type public data networks and/or
public switched telephone networks (PSTN).

In some cases it is even possible to connect a local
area network to a private network via a public network.
In this case, the local area network generally belongs to

25 the proprietor of the private network to which it is
connected. When the proprietor is a company, this
provides persons that it has approved, who are generally
some of its employees, with remote access to the
terminals of the company network, and thus to some of its

30 data, and in some cases to services made available within
the company network. However, to secure the data of the
company, this facility can be used only by persons having
a terminal configured to communicate with the local area
network and the company network while using encryption in

35 a chosen format.

Because only a small number of persons can use the
local area network resources dedicated to connections to

remote networks, whether these are private networks, data networks, or telephone networks, the resources are generally underused, although many other persons present in their coverage area could benefit from them.

5   Accordingly, an object of the invention is to remedy this drawback.

SUMMARY OF THE INVENTION

To this end it proposes a processing server which is dedicated to allocating local area network resources

10   to user terminals and is adapted to be connected to at least one local area network access point by wire (for example by an Ethernet link) or by wireless (for example by an 802.11b radio link).

The server is characterized in that it includes

15   control means adapted, firstly, to classify the terminals attempting to establish communication with the local area network into a first group or a second group according to whether or not communications are encrypted in compliance with at least one format and, secondly, to allocate

20   resources of the local area network to terminals attempting to establish communication therewith as a function of whether they are classified in the first group or the second group.

The control means are advantageously adapted to

25   determine the medium access control (MAC) address of each terminal attempting to establish communication with the local area network and the server advantageously includes means for allocating an IP address to the terminal having the MAC address determined in this way. The allocation

30   means are preferably of the Dynamic Host Configuration Protocol (DHCP)type.

The server preferably further includes a memory for storing a table containing primary MAC addresses associated with first terminals adapted to exchange data

35   frames encrypted in compliance with the chosen format. The table can also contain secondary MAC addresses associated with second terminals adapted to exchange

unencrypted data frames.

The control means are then preferably adapted to determine if a MAC address extracted from a received frame is a primary or secondary MAC address. If it is, the control means send the allocation means a request to allocate the terminal corresponding to the primary or secondary MAC address a primary IP address adapted to enable it to set up a link with at least one first remote network and one second remote network. If not, the control means send the allocation means a request to allocate the terminal corresponding to the MAC address, referred to as the "third" terminal, a secondary IP address adapted to enable it to set up a connection with at least one second remote terminal.

The first terminals are preferably associated with the first remote network, which may be connected to at least one second remote network. For example, they are company terminals, such as portable microcomputers, issued to company employees. Also, the second terminals preferably belong to known users of the first remote network. For example, they are mobile telephones belonging to company employees or to persons associated with the company.

Each first remote network is advantageously selected from the group comprising private networks, IP data networks, and telephone networks (public switched telephone networks or otherwise), and each second remote network is preferably selected from the group comprising IP data networks and telephone networks (public switched telephone networks or otherwise).

According to another feature of the invention the control means can be adapted to allocate at least two priority levels for allocation of resources of the local area network according to whether communications are encrypted in accordance with the chosen format or not. To this end, it is advantageous if the MAC addresses in the table are stored in corresponding relationship to at

least one priority level. For example, a first priority level is allocated to first terminals associated with primary MAC addresses and a second priority level is allocated to second terminals associated with secondary

5 MAC addresses. The control means can also be adapted to allocate a third priority level for allocation of resources of the local area network, for example to third terminals that set up communications that are not encrypted and whose MAC address is not in the table.

10 Other levels higher than the third level can also be envisaged, as a function of the requirements of the application.

The priority levels preferably apply at least to the bandwidth allocated to the terminals and the bandwidth

15 can decrease from the first level to the third level, so that the first terminals are given preference. However, the control means can change dynamically the allocation of bandwidth (or any other priority level) taking account of the traffic (or of the available resources).

20 Accordingly, when traffic is low, a second level can be replaced by a first level and a third level can be replaced by a second level, and when traffic is very low, a third level can be replaced by a first level. The opposite approach is equally possible when the traffic is

25 very high, in which case a first level can be replaced by a second level, or even a third level, or a second level can be replaced by a third level.

However, the priority levels can equally apply to rights of access to local or remote databases, and in

30 particular to rights of access to audio and/or video data, for example in the context of video on demand applications, or to rights of access to physical resources, such as a dedicated terminals or printers.

For example, a server of the invention can be

35 integrated into a router in order to mask the addressing plan of the first remote network (for example a company private network). However, it can equally well be

integrated into an access point.

The invention also provides a communication installation including at least one local area network, for example a wireless local area network (WLAN), accessible via at least one access point, at least one first remote network, at least one second remote network, and a processing server of the kind defined above connected to at least one access point and to the first and second remote networks.

In this installation, the processing server is preferably connected to the first remote network via a virtual private network (VPN). However, it could instead be is connected to the first remote network via a remote access server (RAS).

The invention further provides a method of allocating resources of a local area network to user terminals via at least one access point to the local area network, which method consists in, firstly, in the case of an attempt at setting up a connection with the local area network by a terminal, classifying the terminal in a first group or a second group according to whether the connection is encrypted in accordance with at least one chosen format or not and, secondly, allocating resources of the local area network to the terminal as a function of whether it is classified in the first group or the second group.

In the event of an attempt by a terminal to set up a connection with the local area network, its MAC address is advantageously determined and an IP address is then allocated to the terminal having the MAC address determined in this way.

A table containing primary MAC addresses associated with first terminals adapted to exchange data frames encrypted in accordance with the chosen format is preferably provided and preferably also contains secondary MAC addresses associated with second terminals adapted to exchange unencrypted data frames.

When the above kind of table is present, the method can determine if a MAC address extracted from a received frame is a primary or secondary MAC address; if so, the terminal corresponding to that primary or secondary MAC address is allocated a primary IP address so that it can set up a connection with at least one first remote network and one second remote network; if not, the terminal corresponding to the MAC address, referred to as a third terminal, is allocated a secondary IP address so that it can set up a connection with a least one second remote network.

According to another feature of the invention at least two levels of priority for allocation of resources of the local area network can be allocated according to whether communications are encrypted in accordance with the chosen format or not. In this case, the MAC addresses in the table are advantageously stored in corresponding relationship to at least one priority level, whereby a first priority level can be allocated to first terminals associated with primary MAC addresses and a second priority level can be allocated to second terminals associated with secondary MAC addresses. The third terminals can be allocated a third level of priority for allocation of resources of the local area network.

The priority levels preferably relate at least to the bandwidth allocated to the terminals, which can decrease from the first level to the third level, for example. However, the allocation of bandwidth can equally well change dynamically, taking account of the traffic (or the available resources).

The invention can be implemented in public communication networks (PSTN and PLMN), and in particular in pubic mobile communication networks (GSM, GPRS, and UMTS networks) or private networks (PABX and residential gateways) able to use fixed wireless access, such as WLAN, Bluetooth or Ultra Wide Band (UWB) networks.

<u>BRIEF DESCRIPTION OF THE DRAWINGS</u>

Other features and advantages of the invention will become apparent on reading the following detailed description and examining the single figure of the appended drawing, which shows diagrammatically one example of a communication installation equipped with a processing server of the invention. This figure is intended to contribute not only to describing the invention but also, where appropriate, to defining the invention.

<u>DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS</u>

The installation shown in the single figure includes a private company network CN, a wireless local area network WLAN belonging to a group of companies, for example, a public switched telephone network PSTN belonging to a telephone carrier, and a public data network Internet/IP.

The local area network WLAN has one or more access points 1 connected to an edge router 2 in turn connected to the public switched telephone network PSTN and to the public data network Internet/IP. In the example shown, the access point 1 is connected to the edge router 2 by a cable 3, preferably an Ethernet link. However, the connection could instead be a wireless connection, for example an 802.11b radio link.

The company network CN is connected firstly to the public switched telephone network PSTN via a company server (or gateway) 4 and secondly to the edge router 2 via an IP router 5 having the proxy or firewall function and the public data network Internet/IP, preferably via a virtual private network (VPN) 6 which secures data by tunneling. A remote access server RAS, possibly coupled to a gateway type router, could be used instead of the VPN link.

Furthermore, the installation also includes one or more routers or gateways 7 of infrastructures which belong to Internet service providers ISP and each of

which is connected to the public switched telephone
network PSTN and to the public data network Internet/IP.

The local area network is preferably a wireless
local area network (WLAN), a Bluetooth or Ultra Wide Band
5   (UWB) network, or a cable local area network (LAN).
Moreover, the company network CN is, for example, a
private automatic branch exchange (PABX), possibly of the
wireless type (conforming to the digital European
cordless telecommunications (DECT) standard).
10   Furthermore, although the telephone network is preferably
a public switched telephone network (PSTN), it could
instead be a public land mobile network (PLMN), such as a
GSM, GPRS or UMTS network, for example. Of course, the
invention is not limited to these types of network, or to
15   the chosen number of networks. Thus there could co-exist
a plurality of private networks each having access to one
or more local area networks, a plurality of public data
networks and a plurality of public switched telephone
networks, or only to a plurality of public data networks
20   and a plurality of public switched telephone networks.

The invention is intended to enable persons having
access to a communication terminal 8 equipped with a
removable or integrated LAN or WLAN card 9 to access one
or more networks of the installation, referred to as
25   remote networks, under conditions to be described later,
when they are in the coverage area of a wireless local
area network.

In the example shown, where the local area network
is a wireless local area network, the communication
30   terminals 8 are mobile telephones, portable
microcomputers, or personal digital assistants (PDA), for
example. Each communication terminal 8 has a medium
access control (MAC) address (at level 2 of the ISO's OSI
model), which is generally placed in the header of the
35   data frames that it transmits.

Three types of communication terminal 8 are defined.
A first type of terminal is a mobile terminal 8a that

belongs to (or is associated with) the company to which
the wireless local area network WLAN and the company
network CN belong. In the case of a company, the
terminals 8a are generally portable microcomputers fitted
5   with a WLAN card 9 configured to enable exchange of
encrypted data with one of the access points 1 of the
WLAN using a first format and with the company network CN
using a second format. The first and second formats are
generally different, as it is usual for the access point
10   itself to encrypt data frames received from a terminal 8a
using an algorithm and a key supplied to it by the
manager of the company network CN. The MAC addresses of
the terminals 8a, which are referred to as primary
terminals, are also known to the company and stored in a
15   server of the company network CN.

A second type of terminal is a mobile terminal 8b
that generally belongs to an employee of the company or
outside persons working for the company, for example
consultants. The terminals 8b are generally mobile
20   telephones fitted with a fixed WLAN card. However, this
card is not configured to enable the exchange of
encrypted data with one of the access points 1 of the
WLAN or with the company network CN. The MAC addresses
of the terminals 8b, which are referred to as secondary
25   terminals, are nevertheless known to the company and
stored in the server of the company network CN previously
referred to.

A third type of terminal is a mobile terminal 8c
that belong to a person outside the company. The
30   terminals 8c are mobile telephones, personal digital
assistants, or microcomputers, fitted with a WLAN card.
However, the card is not configured to enable the
exchange of encrypted data with one of the access points
1 of the wireless local area network WLAN or with the
35   company network CN. The MAC addresses of the terminals
8c, which are referred to as tertiary terminals, are
unknown to the company.

A processing server 10 is provided, preferably in
the edge router 2, to enable the terminals 8(a-c) to
access some or all of the networks of the installation,
according to their type. This server could instead be
provided in one of the access points of the wireless
local area network.

When a terminal 8(a-c) is in the coverage area of
the wireless local area network WLAN and wishes to set up
a connection with a remote network of the installation,
it transmits to the access point 1 a connection request
in the form of a data frame containing its MAC address in
its header. If the terminal is a first terminal 8a, the
frames that it sends are already encrypted in accordance
with a first format. On receiving the encrypted frame,
the access point 1 determines or verifies the algorithm
that it must apply to the encrypted frame using the key
that was supplied to it by the manager of the company
network CN to convert it into a frame encrypted in
accordance with a second format.

It is important to note that this determination can
be based on the content of the header of the frame,
although this is not obligatory. In other words, the
access point 1 does not necessarily have to determine or
verify the algorithm that it must apply to the frames
received from the data contained in those frames.
Moreover, it is important to note that frames encrypted
in accordance with the first format and the same frames
unencrypted are processed by parallel processes.

Once the access point 1 has encrypted the frame in
accordance with the second format, it forwards it to the
processing server 2 10.

Otherwise, if the terminal is a second terminal 8b
or a third terminal 8c, the frames that it sends are
unencrypted. Consequently, as soon as the access point 1
receives frames from these terminals, it forwards them to
the processing server 2 10.

The processing server 10 includes a control module

11 which analyses each data frame transmitted by the
access point 1. To be more precise, the control module
11 determines if the frame is encrypted in accordance
with the second format or not. If so, the control module
5   11 classifies the terminal that sent it in a first group
corresponding to the first terminals 8a, which are
authorized to access the company network CN and the
public networks, in this example the public switched
telephone network PSTN and the public data network
10   Internet/IP. If not, it classifies the terminal that
sent it in a second group corresponding to the second
terminals 8b or the third terminals 8c, which are *a
priori* authorized only to access the public networks, in
this example the pubic switched telephone network PSTN
15   and the public data network Internet/IP.

The control module 11 then assigns resources of the
wireless local area network WLAN to the terminal, but
without actually allocating them, and the terminal
attempts to connect to the remote networks, as a function
20   of whether it is classified in the first or the second
group.

In a basic embodiment of the invention, processing
continues with the transmission of instructions by the
control module 11 to the access point 1 to which the
25   terminal 8 that submitted the connection request is
connected, including a request to allocate the terminal
resources of a first or second type, depending on whether
it is a first terminal 8a, a second terminal 8b, or a
third terminal 8c. For example, the first terminals 8a
30   are allocated a high bandwidth whereas the second
terminals 8b and the third terminals 8c are allocated a
low bandwidth. The first terminals 8a can then, in the
conventional way, connect to any of the remote networks
(company network CN, data network Internet/IP, or public
35   switched telephone network PSTN), whereas the second
terminals 8b and third terminals 8c can connect only to
the public data network Internet/IP or the public

switched telephone network PSTN, as if they were connected directly to the edge router 2.

However, the priority levels can relate to parameters other than the bandwidth, for example the
5 right of access to local or remote databases, and in particular to stockmarket or weather databases, or to audio and/or video databases, for example in the context of video streaming or video on demand applications, or the right of access to physical resources such as
10 dedicated terminals or printers.

In this basic embodiment of the invention, the processing effected by the processing server 10 therefore ceases at this stage.

However, the invention goes further than this. It
15 proposes that the second terminals 8b, which generally belong to employees of the company, have the benefit of access to the company network CN, even though their terminals are not configured to transmit frames encrypted in accordance with the first format. To this end, the
20 control module 11 is adapted to determine the MAC address contained in the header of the frame initially supplied to it by the access point 1, at the time of a connection request submitted by a terminal 8, and after determining whether the request was encrypted or not. Once this has
25 been determined, the terminal 8 can send an IP address allocation request to the processing server 10. The latter includes an IP address allocation module 12 coupled to the control module 11, and preferably taking the form of a Dynamic Host Configuration Protocol (DHCP)
30 server.

As the person skilled in the art knows, a DHCP allocation module automatically distributes an IP address to a terminal or an equipment unit that wishes to dialogue with equipment situated outside a local area
35 network. It generally constitutes a superset of BOOTP. Unlike the Internet address, the IP address actually (i.e. physically) identifies a terminal. It generally

consists of four numbers in the range [0-255] separated
by full stops. An IP address and an Internet address are
generally linked by a Domain Name System (DNS) server.

Once the allocation module 12 has allocated an IP

5   address to the terminal 8 whose MAC address has been
determined by the control module 11, the terminal can
dialogue with equipment units in the remote networks, if
it is an approved terminal.

The processing server ~~11~~ 10 preferably includes a

10   memory 13 storing a table containing primary MAC
addresses associated with first terminals 8a and
preferably containing secondary MAC addresses associated
with second terminals 8b. This table is supplied by the
manager of the company network CN, preferably via the VPN

15   link 6. As a general rule, all management information
for configuring the processing server 10 is transmitted
by the manager of the company network CN, preferably via
the VPN link 6.

The control module 11 can access the memory 13 to

20   verify if the MAC address that it has determined in the
header of the frame received is a primary MAC address, a
secondary MAC address, or a tertiary MAC address if it
belongs to a third terminal 8c whose MAC address is
unknown.

25   If the MAC address of the terminal 8a or 8b is a
primary or secondary MAC address, the control module 11
sends the allocation module 12 a request to allocate the
terminal concerned a primary IP address (company IP
address) to enable it to set up a link with one of the

30   remote networks to which the local area network is
connected via the edge router 2, including the company
network CN. On the other hand, if the MAC address of the
terminal 8c is a tertiary MAC address (in other words, if
it is not in the table stored in the memory 13), the

35   control module 11 sends the allocation module 12 a
request to allocate the terminal in question a secondary
IP address (non-company IP address) enabling it to set up

a link with the Internet/IP network via the infrastructure 7 of its service provider or with the public switched telephone network PSTN, possibly via a telephone access server, and not with the company network

5   CN, since it is not approved by the latter.

However, the control module 11 can also be adapted to allocate a plurality of WLAN resource allocation priority levels according to whether communications are encrypted in accordance with the second format or not.

10   The objective is to give the first terminals 8a priority over the second terminals 8b and the second terminals 8b priority over the third terminals 8c.

To this end, each primary and secondary MAC address from the table is stored in corresponding relationship to

15   a priority level. For example, the table can be divided into two parts, one containing primary MAC addresses associated with a first priority level and the other containing secondary MAC addresses associated with a second priority level. By a process of deduction, the

20   third terminals 8c associated with an (unknown) tertiary MAC address are automatically allocated a third priority level.

The priority levels preferably relate at least to the bandwidth allocated to the terminals 8. For example,

25   the bandwidth decreases from the first level to the third level to give first terminals 8a belonging to the company priority over second terminals 8b belonging to employees of the company or to persons associated therewith and to give second terminals 8b priority over third terminals 8c

30   belonging to persons outside the company. The priority level that is allocated to a terminal 8 is communicated to the access point 1 which is the equipment unit of the wireless local area network WLAN responsible for allocating resources of that network.

35   Moreover, in order to take account of the conditions of use of the resources of the wireless local area network WLAN in real time, the control module 11 is

preferably able to modify dynamically the priority level
that it allocates to the terminal 8 on the basis of
information contained in the address table. For example,
if the control module 11 has allocated a second terminal
5   8b a second priority level (that corresponds to an
intermediate bandwidth, for example), and the traffic on
the wireless local area network WLAN is low or moderate
(which corresponds to a large number of available
resources), it can decide to change this second level
10   into a first level (corresponding to the greatest
bandwidth, for example). Under the same traffic
conditions, the control module 11 could also decide to
change a third priority level allocated to a third
terminal 8c into a second level. Moreover, if the
15   traffic of the wireless local area network WLAN is very
low (which corresponds to a very large number of
available resources), the control module 11 can decide to
change a third priority level allocated to a third
terminal 8c into a first level.
20   The opposite approach can also be envisaged.
Indeed, it may happen that the traffic in a wireless
local area network WLAN is very high and that it is not
possible to satisfy the demands of all the terminals 8,
including the first terminals 8a. Consequently, the
25   control module 11 can be adapted to change a first
priority level allocated to a first terminal 8a into a
second level or even a third level (corresponding to the
lowest bandwidth). Similarly, it can change a second
priority level allocated to a second terminal 8b into a
30   third level.
        Instead of or in addition to this, defining user
profiles associated with some of the MAC addresses from
the table can be envisaged. Accordingly, when the
control module recognizes an MAC address of this kind, it
35   can command the access point to allocate the terminal
having that MAC address resources corresponding to the
associated profile.

A few examples of the operation of an installation of the invention are described next.

Once the control module 11 has determined the MAC address, and where applicable the associated priority level (or profile), and the allocation module 12 has allocated an IP address to the terminal 8, the latter can, if it is a first terminal 8a or a second terminal 8b of the microcomputer type, access in the conventional way either the company network CN via the proxy router 5 or the data network Internet/IP via the VPN link 6. The proxy router 5 generally prompts the terminal user to identify himself by entering his login name and his password. If the first terminal 8a or the second terminal 8b is a mobile telephone, it is conventionally routed to the company gateway server 4 in order to be connected to the public switched telephone network PSTN or directly to a terminal of an employee of the company (via the internal telephone network). If the calling user transmits only one name, his call can be processed by a company Domain Name System (DNS) server or by a company Lightweight Directory Access Protocol (LDAP) directory.

If the terminal is a third terminal 8c of the microcomputer type, it can conventionally access only the data network Internet/IP via the infrastructure 7 of its usual Internet service provider ISP. It can use its browser for this. During the phase of identification of the user of the third terminal 8c by the ISP, the latter can decide to change the secondary IP address previously allocated by the allocation module 12.

Finally, if the terminal is a third terminal 8c of the mobile telephone type, two options can be envisaged. If the telephone 8c is a GSM, GPRS or UMTS telephone with an integrated local directory, the edge router 2 allocates it a media-gateway type characteristic, for example in accordance with the IETF Media Gateway Control Protocol (MGCP), which enables it to access directly the

public switched telephone network PSTN. If not, the call
is routed by the edge router 2 to the infrastructure 7 of
the user's Internet service provider ISP which processes
it by conventional name conversion, connection to the
5   public switched telephone network PSTN, and the like, for
example.

       The control module 11 and the allocation module 12
of the processing server 10 of the invention can take the
form of electronic circuits, software (or data
10   processing) modules, or a combination of circuits and
software.

       The invention also provides a method of allocating
resources of a wireless local area network (WLAN) or a
cable local area network (LAN) to user terminals 8 via at
15   least one access point 1.

       This can be done using the processing server 8̶ 10
and the communication installation described hereinabove.
The main and optional functions and sub-functions
provided by the steps of the method being substantially
20   identical to those provided by the various means
constituting the processing server 10 and the
installation, only the steps implementing the main
functions of a method of the invention are summarized
hereinafter.

25   In a method of the invention, when a terminal 8
attempts to set up a connection with the wireless local
area network WLAN, it is, firstly, classified in a first
group or a second group according to whether the link is
encrypted in accordance with at least one chosen format
30   or not and, secondly, allocated resources of the wireless
local area network WLAN as a function of whether it is
classified in the first group or the second group.

       Preferably, when a terminal 8 attempts to set up a
connection with the wireless local area network WLAN, its
35   MAC address is determined and it is then allocated an IP
address.

       Moreover, in the presence of a MAC address table, it

is possible to determine if the MAC address extracted
from a received frame is a primary or secondary MAC
address and, if so, to allocate the terminal 8(a, b)
corresponding to that primary or secondary MAC address a
5   primary IP address enabling it to set up a connection
with at least one first remote network or at least one
second remote network and, if not, to allocate the
terminal 8c corresponding to the MAC address, referred to
as a third terminal, a secondary IP address enabling it
10 to set up a connection with at least one second remote
network.

Furthermore, at least two priority levels for
allocation of resources of the wireless local area
network WLAN can be allocated according to whether
15 communications are encrypted in the chosen format or not.
In this case, it is advantageous if the MAC addresses in
the table are stored in corresponding relationship to at
least one priority level, in which case a first priority
level can be allocated to first terminals 8a associated
20 with primary MAC addresses and a second priority level
can be allocated to second terminals 8b associated with
secondary MAC addresses. A third priority level for
allocation of local area network resources to third
terminals 8c can also allocated.

25 Thanks to the invention, it is now possible for
persons who have no *a priori* authorization to access
remote networks connected to a cable local area network
(LAN) or a wireless local area network (WLAN)
nevertheless to access at least some of the remote
30 networks, provided that the local area network concerned
has sufficient resources available. Such access can be
charged or free-of-charge. This significantly improves
the mobility of the communication terminals. Moreover,
it enables local area network proprietors to make access
35 to data or telephone networks available to all potential
users. Thus in areas that do not have good radio
coverage, by installing a local area network of moderate

cost, all users requiring to do so can connect to the network of their telephone carrier and even to the Internet.

Furthermore, the invention can define priority levels for allocating local area network resources, or even specific resource allocation profiles, regardless of the type of resource concerned, including physical resources such as printers or database access terminals.

The invention is not limited to the embodiments of a method, a server and an installation described hereinabove by way of example only, but encompasses all variants falling within the scope of the following claims that the person skilled in the art might envisage.

Thus in the foregoing description there are references to priority levels applying to bandwidths. However, the invention can apply to any other priority level relating to the modes of allocating resources of a local area network, and in particular physical resources such as printers and terminals providing access to databases of any type, in particular stockmarket and weather databases.

Moreover, an application of the invention to wireless local area networks (WLAN) has been described. However, the invention applies equally well to cable local area networks (LAN), Bluetooth and UWB local area networks.

Moreover, an installation in which the local area network belongs to a company or to a group of companies having a private network (or first remote network) connected to said local area network has been described. However, the invention relates equally well to local area networks that are not connected to private networks. In this case, the local area network can be connected only to one or more data networks (or first or second remote networks) and/or to one or more telephone networks (or first or second remote networks).

Furthermore, a company private network has been

referred to, but the invention applies to any private network that is connected to a local area network via a processing server of the invention.

Finally, a processing server installed in a router 5 has been described. However, the processing server can equally well be installed in an access point of the local area network.